



## DOE Tools & Resources for Manufacturers

Maryland Next-Gen Manufacturing Energy Forum  
Timonium, MD: June 6, 2012

## Andre de Fontaine

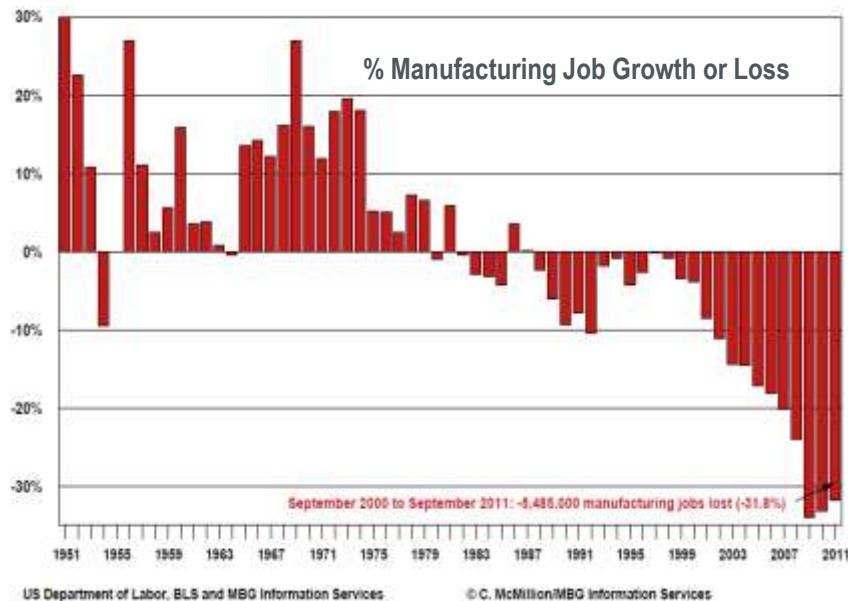
U.S. Department of Energy  
Office of Energy Efficiency & Renewable Energy  
Advanced Manufacturing Office

- Advanced Manufacturing Office (AMO) Overview
- AMO Tools & Resources to Advance Energy Efficiency
- Superior Energy Performance
- Better Buildings, Better Plants

- 11% of U.S. GDP
- 12 million U.S. jobs
- 60% of U.S. engineering and science jobs
- 57% of U.S. Exports
- Nearly 20% of the worlds manufactured value added

## Jobs

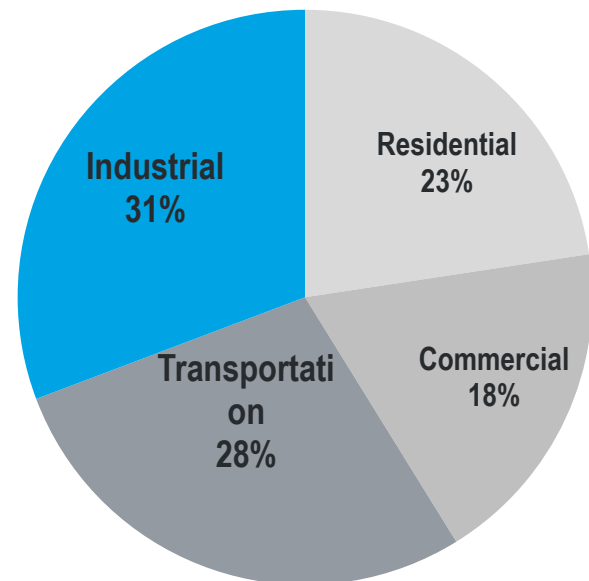
31.8% of all manufacturing jobs lost from 2000-2011



First 11-year private sector job losses since the 1930s

## Energy

31% of all 2010 U.S. total energy consumption



\*Includes total primary energy direct use and electricity use in end-use sectors including losses  
Source: Annual Energy Review 2010, US EIA



“Of course, the easiest way to save money is to waste less energy. So here’s a proposal: Help manufacturers eliminate energy waste in their factories and give businesses incentives to upgrade their buildings. Their energy bills will be \$100 billion lower over the next decade, and America will have less pollution, more manufacturing, more jobs for construction workers who need them.”

—President Obama, 2012 State of the Union Address

Official White House Photo by Pete Souza

## Next Generation Materials

Pervasive materials  
technologies that lead to  
better products

## Next Generation Manufacturing Processes

Broadly applicable  
processes that lead to better  
production

## Technology Deployment

Promote better energy use  
practices to capture U.S.  
competitive advantage

### Technology Projects - Innovative Manufacturing Initiative (IMI)

Competitively selected, cost-shared technology projects:

- Produce pre-competitive and generic products
- Reduce energy consumption over product life-cycles
- Increase the adaptability of manufacturers through alternate materials and process pathways
- Not directed at products to be sold competitively in existing markets
- Maintained project support through manufacturing-scale demonstration

### Targeted Partnerships

- Superior Energy Performance
- Better Buildings, Better Plants
- Workforce Development
- Clean Energy Application Centers
- Supply Chain Initiative
- Utilities and States

TRL 2-6

TRL 2-8

TRL 9

## DOE programs and resources drive measureable results in industrial energy efficiency.



### Better Plants Challenge and Program

*Corporate Level*



### Superior Energy Performance Program

*Facility Level*



### AMO Energy Resources Center

*Corporate- and Facility-Level  
Tools and Training*

DOE  
Resources for  
Companies

DOE  
Resources  
for Facilities

## Results

- CEO commitments
- Corporate energy savings goals and management plans
- Resources dedicated for facilities
- Established energy management programs
- Continual energy performance improvements
- SEP-certified facilities
- Dollar savings
- Replicated best practices



# AMO Software Tools Help Advance Energy Efficiency in the Manufacturing Sector

*AMO hosts over 40 software tools on our website. These tools provide plants and manufacturers with a wide variety of measurement, calculation, and tracking capabilities related to energy efficiency.*

## Energy Performance Tracking

Energy Performance Indicator  
v.2.0 Tool

Project Opportunities Tracker

Corporate Energy Performance  
Tracking for Better Plants Partners

Facility Energy Performance  
Tracking for Superior Energy  
Performance

## Energy Management

eGuide for ISO 50001

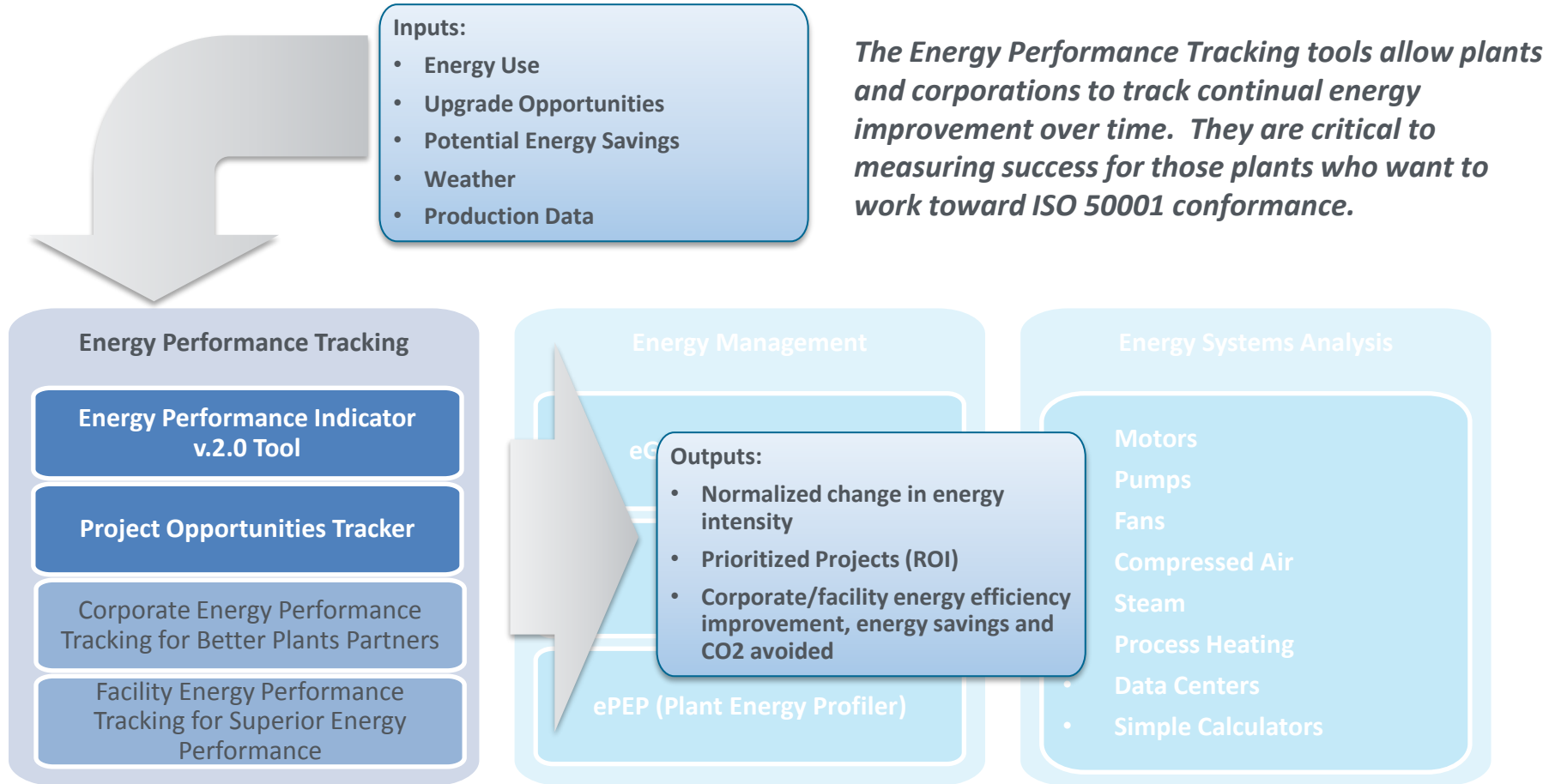
eGuide Lite

ePEP (Plant Energy Profiler)

## Energy Systems Analysis

- Motors
- Pumps
- Fans
- Compressed Air
- Steam
- Process Heating
- Data Centers
- Simple Calculators

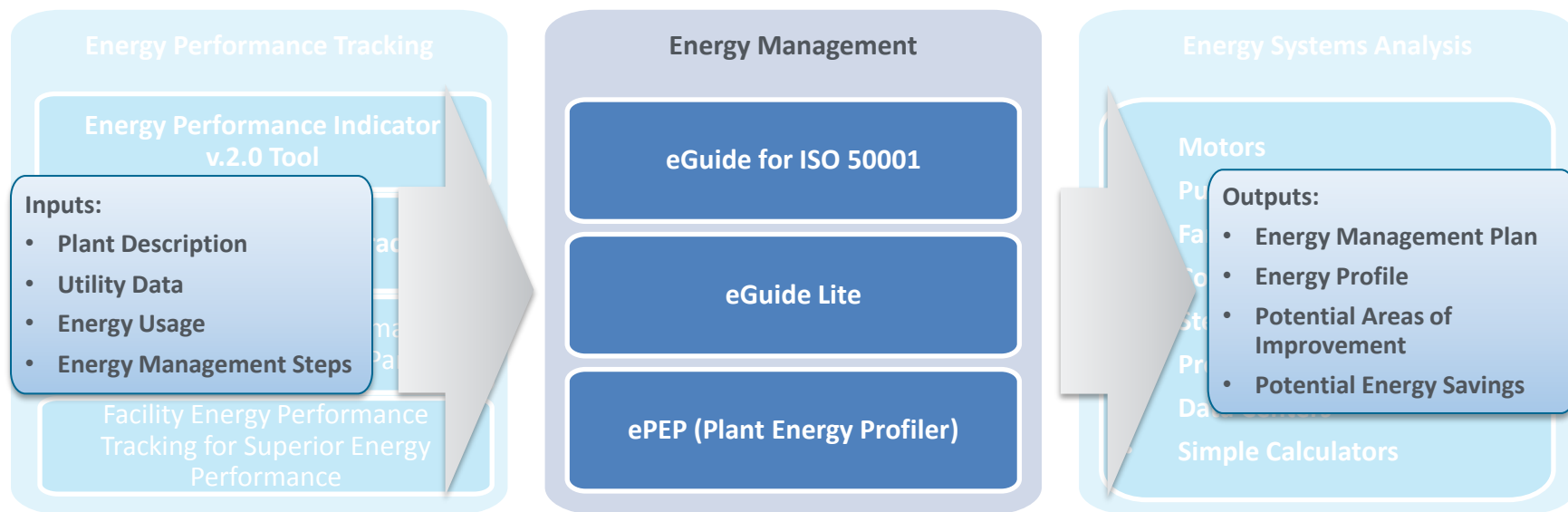
# AMO Energy Performance Tracking – Tools Inputs and Outputs





# AMO Energy Management – Tools Inputs and Outputs

*Energy Management tools help plants pursue continual energy improvement with the goal of working towards ISO 50001 conformance. They provide step-by-step guidance for energy management programs as well as identify key areas for improvement.*



# AMO Energy Management – Tools Inputs and Outputs

*The Energy Systems Analysis tools have established a track record of finding energy saving opportunities in American manufacturing. These tools focus on particular energy subsystems in plants and provide specific, actionable recommendations for savings.*

## Inputs:

- Energy Use
- Equipment System Characteristics
- Utility Info



## Energy Systems Analysis

- Motors
- Pumps
- Fans
- Compressed Air
- Steam
- Process Heating
- Data Centers
- Simple Calculators

## Outputs:

- Energy System Optimization Opportunities
- Potential Energy Savings
- Estimated Cost Savings
- Avoided CO2 Emissions



## Energy Performance Tracking

Energy Performance Indicator  
v.2.0 Tool

Project Opportunities Track

Corporate Energy Performance  
Tracking for Better Plants Part

Facility Energy Performance  
Tracking for Superior Energy  
Performance

## Energy Management

Guide for ISO 50001

ePEP (Plant Energy Profile)

# Industrial Assessment Centers

U.S. DEPARTMENT OF  
**ENERGY**

Energy Efficiency &  
Renewable Energy



## Industrial Assessment Centers 2012-2016



- Significant (10-30 percent) energy efficiency in industry can be achieved through operational changes in how energy is managed in an industrial facility; installation of new technologies will further improve energy efficiency;
- Actively managing energy requires an **organizational change in culture**
- **Top management needs to be engaged** in the management of energy on an ongoing basis.
- At its core, energy management requires a group of people to **change their behavior** and **sustain the change**

## *Scope of energy management*

*facilities*

*equipment*

*personnel*

*systems*

*processes*

# What is Superior Energy Performance?

A market-based, ANSI/ANAB-accredited certification program that provides industrial and commercial facilities with a roadmap for achieving continual improvement in energy efficiency while boosting competitiveness.

## Goals:

- Drive continual improvement in energy performance
- Develop a transparent system to validate energy performance improvements and management practices
- Encourage broad participation throughout industry
- Support and build the energy efficiency market and workforce



**Superior Energy  
Performance for industry will  
be launched nationwide in  
Fall 2012.**

## SEP Demonstrations involve:

- Testing ANSI-accredited Superior Energy Performance program
- Using newly-released ISO 50001 energy management standard
- Third party verification on energy performance improvement using measurement & verification protocol
- 35 companies in 20 states

## Industrial Participants:

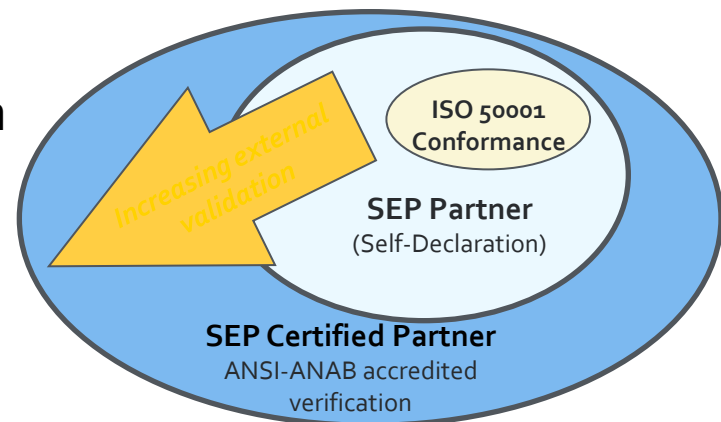
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|--------------------------------|------------------------------|--------------------------|----------------------|
| • 3M Company                   | • Cook Composites & Polymers | • Harbec Plastics        | • OLAM Spices        |
| • Alcoa                        | • Cooper Tire                | • Haynes International   | • Owens Corning      |
| • Allsteel                     | • Cummins                    | • Holcim                 | • Republic Conduit   |
| • Amcor PET                    | • Didion Milling, Inc        | • Ingersoll Rand         | • Schneider Electric |
| • Ascend Performance Materials | • Dixie Chemical             | • JR Simplot             | • Spirax Sarco       |
| • Bentley Prince Street        | • Dow Chemical               | • Kenworth Trucks        | • Traco              |
| • Bridgestone Tire             | • Eaton                      | • Lockheed Martin        | • UTC/Sikorsky       |
| • Coca-Cola                    | • Freescale Semiconductor    | • MedImmune              | • United States Mint |
|                                | • General Dynamics           | • Neenah Foundry Company | • Volvo              |
|                                |                              | • Nissan                 | • World Kitchen      |

[www.superiorenergyperformance.net](http://www.superiorenergyperformance.net)



## Two-tiered approach accommodates:

- Maturity of facility's energy management program
- Level of external validation desired
- Business climate/cycle



## Two Program Tiers:

### Partner

#### *Self Declaration*

##### Criteria

- Conformance to ISO 50001
- Measure and audit energy performance improvement

##### Performance Levels

- Energy performance improvement required

##### Method of Verifying Results

- Self Declaration

### Certified Partner

#### *ANSI-ANAB accredited certification*

##### Criteria

- Conformance to ISO 50001
- Measure, verify, and certify energy performance improvement

##### Performance Levels

- Energy performance improvement required, minimum requirements set by program
- Two pathways available: Energy Performance or Mature Energy

##### Method of Verifying Results

- ANSI/ANAB-accredited certification with on-site review



***Make commercial and industrial buildings 20% more efficient by 2020; save more than \$40 billion annually for US organizations; create American jobs***

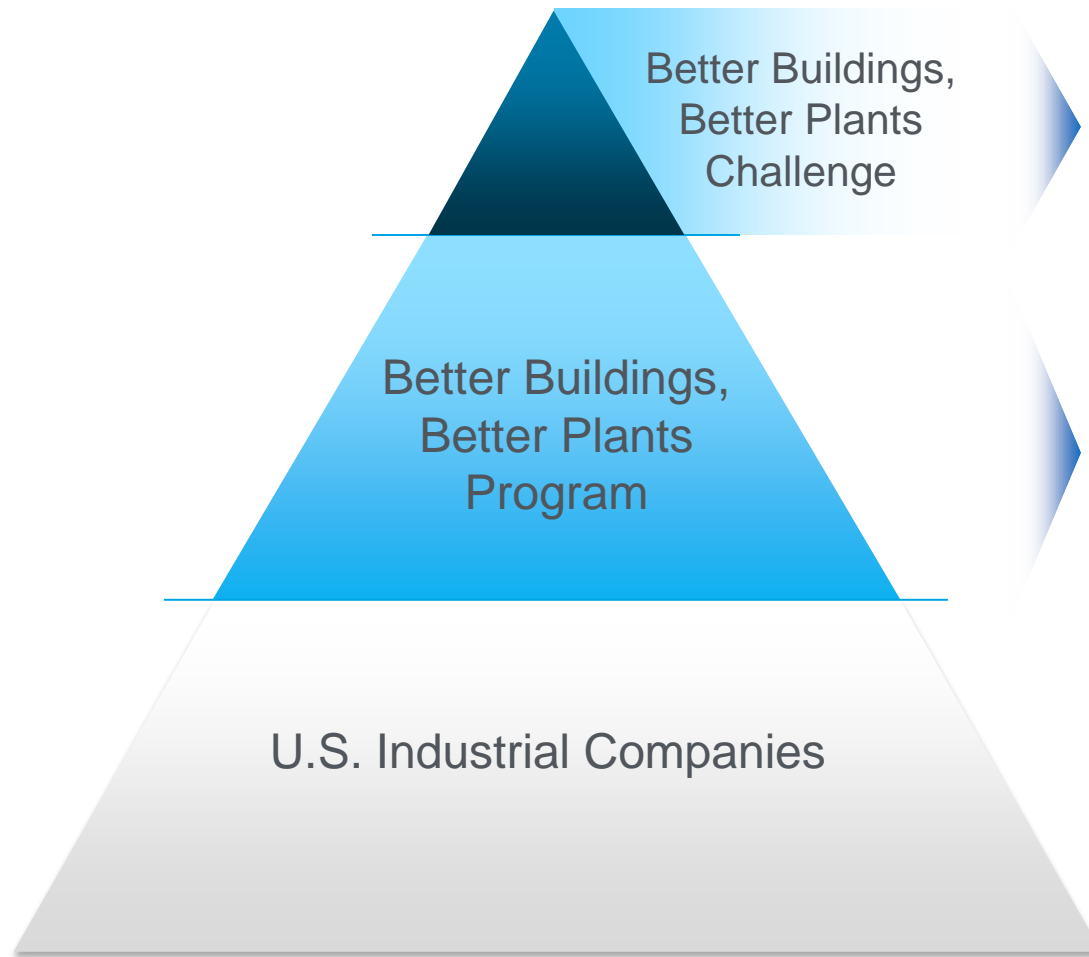
- Market leadership; high level partnership with DOE
- Overcome market barriers/persistent obstacles with replicable, marketplace solutions
- Showcasing real solutions; provide models for others to follow
- Recognition from DOE and Administration for success
- Partnering with industry leaders to better understand policy and technical opportunities
- Portfolio wide commitment to continuous improvement



President Obama and former President Clinton take a tour of the upgrades of the Transwestern Building in Washington, Dec. 2, 2011

(Official White House Photo by Lawrence Jackson)

- The Better Buildings, Better Plants Program & Challenge is the industrial component of the **Better Buildings Challenge**
- Better Buildings, Better Plants provides different opportunities for national recognition based on level of commitment:
  - **Better Buildings, Better Plants Program Partners** pledge energy savings goals consistent with national targets and agree to report progress annually to DOE.
  - **Better Buildings, Better Plants Challenge Partners** agree to transparently pursue innovative approaches to energy efficiency, and make a significant, near-term investment in an energy saving project or set of projects



- 10-year, 25% savings target or more
- Adopt “market innovations”
- Transparency in market innovations
- Quarterly reporting on innovations
- Annual reporting on results

*Recognized as premier market leaders*

- 10-year, 25% savings target
- Annual reporting

- Better Buildings, Better Plants Program builds on the success of previous DOE partnership programs. Partners:
  - Set a 10-year, 25% energy intensity improvement target
  - Develop energy management plans
  - Track and report energy data annually to DOE
  - Receive national recognition for their achievements
  - Receive support from technical account managers
- Program currently consists of 110 companies and over 1,400 plants, consuming about 1,100 TBtus of energy annually, or about 5% of the total U.S. manufacturing energy footprint
- Most companies are on track to meet the 10-year target

# Better Buildings Challenge Partners

U.S. DEPARTMENT OF  
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DOE AMO: <http://www1.eere.energy.gov/manufacturing/>

Better Buildings Challenge: [www.betterbuildings.energy.gov/challenge](http://www.betterbuildings.energy.gov/challenge)

Better Buildings, Better Plants Program:  
[http://www1.eere.energy.gov/manufacturing/tech\\_deployment/betterplants/](http://www1.eere.energy.gov/manufacturing/tech_deployment/betterplants/)